26. The method according to claim 25, wherein the first component comprises a Group VI element.

27. The method according to claim 26 wherein the compound is selected from the group consisting of CdTe, CdZnTe, and HgZnCdTe.

28. The method according to claim 25, wherein photo-electrochemical reduction of the first component comprises:

depositing a removable N-type conductive material on the alloy-semiconductor material;

connecting the deposited material to a negative terminal of a power supply;

connecting an electrode disposed in an electrolyte solution to a positive terminal of the power supply; and

exposing the electrolyte solution to a light source.

29. The method according to claim 28, wherein the removable N-type conductive material comprises an Hg-In eutectic paste.

30. The method according to claim 28, wherein the light source comprises a near infrared wavelength light and has a median energy equal to the band gap of the alloy-semiconductor material.

31. The method according to claim 28, wherein the electrolyte solution comprises a pH of at least about 10.5.

32. The method according to claim 25, further comprising forming a P-type contact on the alloy-semiconductor material.

33. The method according to claim 32, wherein the step of forming a P-type contact comprises metal deposition.

34. The method according to claim 33, further comprises depositing a P-type metal on the P-type contact.

35. The method according to claim 34, wherein the step of depositing the P-type metal comprises depositing the P-type metal by vacuum deposition or electrodeless chemical exchange.

36. The method according to claim 32, wherein the alloy-semiconductor material further comprises a second component, the second component a complimentary component of the first component, the method further comprising removing the second component to form the P-type contact.

37. The method according to claim 36, wherein the step of removing the second component comprises chemical etching.

38. The method according to claim 37, further comprising exposing an area of the alloy-semiconductor material comprising the P-type contact to a retarding

electrochemical potential to etch the second component at a faster rate than the first component.

39. The method according to claim 37, wherein the step of removing the second component by chemical etching comprises exposing the alloy-semiconductor material to an oxidizing agent comprising nitric acid and phosphoric acid.

40. The method according to claim 39, wherein the nitric acid is present in an amount from about 0.1% to about 0.5% by volume.

41. The method according to claim 39, wherein the oxidizing agent comprises a solution of HNO_3, distilled H_2O, and H_3PO_4, in a ratio of 2:33:85 by volume.

42. A method for forming a rectifying junction on an alloy-semiconductor material comprising a compound comprising a first component and a second component, the method comprising:

photo-electrochemical removal of the first component from a first portion of the alloy-semiconductor material to form an N-type contact; and

removing the second component from a second portion of the alloy-semiconductor material to form a P-type contact.

43. The method according to claim 42, wherein the step of removing the second component comprises chemical etching.

44. The method according to claim 42, wherein the alloy-semiconductor material is selected from the group consisting of CdTe, CdZnTe, HgZnCdTe, and HgCdZnSe.